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ABSTRACT

An analysis was made of characteristics of students participating in the various types and numbers of institutional contacts before enrolling in college. The purpose was to examine the relationship of student pre-enrollment contacts with the university to student enrollment and retention. Records identifying potential 1980 entering freshmen having participated in a form of contact with the University of Iowa were obtained for each of 21 forms of contact (high school visit, campus visit, forwarding test scores, mail inquiry, etc.). This information was matched with registrar's information regarding application and enrollment, American College Testing (ACT) program scores, and ACT Profile information, resulting in a data set containing 13,066 cases. Findings include the relationship between number of contacts and eventual application and enrollment, characteristics of those contacted through the various activities, and the relationship of the number and types of contacts and eventual application and enrollment to retention of students through the freshman year at the university. Some of the specific findings were: the proportion of students applying and enrolling increased with the number of pre-enrollment contacts; ACT composite scores, college grade point average, expected level of education, expected grade point average, total musical activity, and planned and previous extracurricular involvement were positively related to the number of contacts; and a hypothesis of differential freshman year persistence behaviors for those contacted and those not contacted was not supported. (Author/LBJ)

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PRE-ENROLLMENT CONTACTS AND CHARACTERISTICS OF STUDENTS WHO ENROLL

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LeAnn M. Gamache
The University of Iowa

Paper presented at the Annual Convention of the American Psychological Association, Los Angeles, California, August 25, 1981

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ABSTRACT

At most colleges and universities considerable time and effort is invested in outreach programs designed to contact pre-college students and promote post high school education. Use of information from such programs can serve as an alternative to traditional analysis of pre-enrollment information in research on student flow and retention. The study examined the relationship of pre-enrollment contacts with the university to student enrollment and retention. An analysis was made of characteristics of students participating in the various types and numbers of contacts. Findings include the relationship between number of contacts and eventual application and enrollment, characteristics of those contacted through the various activities, and the relationship of the number and type of contacts to retention of students through the freshman year at the university. Results of the study provide information for evaluation of the outreach program activities and for planning future direction and emphasis of the program. The study outlines potential for use of ongoing program information in the study of student flow and retention.

INTRODUCTION

In coming to the university, students bring with them not only personal characteristics such as interests, abilities, and expectations but a history of pre-enrollment contact with the university as well. Study of the characteristics of entering freshmen at the University of Iowa from application information and ACT profile data has been extensive (Doolitle, 1980; Curran, 1980; Whitney, 1974; Whitney & Kolen, 1976) and routinely reported by the office of the registrar. The history of a student's contact with the university may provide further information about student characteristics. Such contact may also influence students' perception of the university and, thus, their expectation of future involvement and enrollment. In addition to influencing application and enrollment, students' perception of the university has been viewed as integral to a model of the persistence/withdrawal decision (Pascarella, 1980).

Students' initial pre-enrollment contact with the university may include a range of activities such as participation in high school and campus visits, music or sports camp activities, and application for scholarship awards. The more traditional mailing letters of inquiry and ACT or SAT scores to the university also constitute common pre-enroll-

sent contacts. Analysis of forms of pre-enrollment contact with the university may provide not only information related to the likelihood of enrollment of the student but may enable identification of self-selected subpopulations of students with similar personal characterics and/or similar enrollment, academic, and persitence behaviors. The purpose of this study was to (1) examine application, enrollment, and persistence behaviors of students involved in the various forms and numbers of pre-enrollment contacts; and (2) examine characteristics of students having participated in various types and number of contacts with the universtiy prior to application and enrollment.

METHOD

Records identifying potential 1980 entering freshmen having participated in a form of contact with the university were obtained for each of twenty-one forms of contact. This information was matched with registrar's information regarding application and enrollment, ACT scores, and ACT Profile information. The resulting data set contained 13,066 cases. A large majority of the contacts consisted of students' forwarding of ACT and SAT score reports. Four other forms of pre-enrollment contact had sample sizes sufficient to warrant further investigation: 2,115 high school visit contacts were recorded from attendance of potential students at meetings in the high schools with university outreach staff; 765 mail inquiry contacts were recorded for prospective stu-

dents who returned a card indicating their receipt of materials which they had requested by mail from the university; 287 campus visits by prospective students were recorded; and 399 contacts were recorded as prospective students applied for Presidential Scholarship awards. It was assumed error in the process of the recording of contacts would be one of omission and occur randomly across the various forms of contact. These contacts were not mutually exclusive. Some prospective students had as many as five different forms of contact with the university. The number of contacts was accumulated for each of the 13,066 cases so the relationship between number of contacts and various characteristics could be examined as well.

Thirty-two variables were examined as to relationship with type and number of contacts. These data were obtained from enrollment and grade point average information from the registrar's records, ACT test scores, and the ACT Student Profile Report. The ACT tests assess academic skills and aptitudes in English, mathematics, natural science, and social science. The composite score, an average of the standard scores for these tests, was one variable of interest in the study. The ACT Student Profile Report provided self-report data related to demographics, past accomplishments, future expectations, special needs, educational and vocational objectives, and interests.

A descriptive analysis was made of proportions of potential freshmen contacted who proceeded through the application, enrollment, and persistence stages to examine the relationship of type and number of contacts to application, enrollment, and persistence. Subsequent comparison of characteristics of those having participated in the various types and number of contacts was restricted to the 1980 freshmen class. Complete data was, of course, not available for those contacted who did not enroll at the university. Analysis of variance procedures were used for each form of contact to compare characteristics of those having participated in the contact against those 1980 freshmen not contacted. The relationship between number of contacts and these characteristics was also examined using analysis of variance procedures. Variables examined are listed in Appendix A.

RESULTS

Application, Enrollment, and Persistence

The proportion of students applying and enrolling was found to increase with the number of pre-enrollment contacts as shown in Table 1.

Insert Table 1 here

Of the 10,889 having only one pre-enrollment contact with the university, 27.4% applied and 15.7% enrolled in the fall of 1980 upon graduation from high school. Eighty-eight and

two tenths percent of those having three contacts applied and 53.5% proceeded to enroll. Only two people had five contacts, but both applied and enrolled for the semester following graduation. The proportion of students persisting through the freshman year increased with the number of pre-enrollment contacts. Retention of those who enrolled with one contact was 90.9%. All students having had four contacts persisted through their freshman year. Overall, 91.6% of those freshmen enrolling in the fall of 1980 completed the freshman year at the university.

Table 2 summarizes by form of contact the proportions of prospective students applying and enrolling for the semester following their high school graduation.

Insert Table 2 here

Contact with the Presidential Scholarship program was associated with application of 79.9% of those contacted and enrollment of 46.9%. Of those contacted through high school visits, 47.6% applied and 29.9% enrolled at the university. Across all twenty-one forms of contact 34.3% applied and 20.2% enrolled. The proportions of those participating in the high school visit, return of mail inquiry card, campus visit, and Presidential Scholarship application who persisted through the freshman year were substantially greater than the 18.5% for the entire population. Approximately forty-

five percent of those having applied for the Presidetial Scholarships completed their freshman year at the university. Ninety-five percent of these students who had proceeded to enroll persisted in comparison with 91.6% of those not applying for these scholarships.

Characteristics of Subpopulations Defined by Contact

Results of the analysis of variance examination of characteristics of the enrolled freshmen participating in the various number and forms of pre-enrollment contact were found to differ significantly from nonparticipants and are presented in Tables 3 through 7.

Insert Table 3 here

Table 3 indicates the variables found to be significantly related to the number of pre-enrollment contacts, the direction of relationship, level of significance, and overall mean for the combined groups. Fewer than two varibles would have been expected to show significance at $p<.05$ by chance alone. ACT composite scores, college grade point average, expected level of education, expected grade point average, total musical activity, and planned and previous extracurricular involvement were found to be positively related to the number of contacts. The greater the number of contacts, the higher the ACT composite score, college grade point average,

degree of extracurricular involvement, etc. The difference between college grade point average and that earned in high school and the size of the hometown community were negatively related to the number of pre-enrollment contacts. The fewer the number of contacts, the greater the difference between the grade point averages and the larger the hometown community. A non-directional relationship was found between number of contacts and variables related to expressed need for assistance in study skills and math, the position along one factor vector of the ACT interest map, and the deviation between that interest map profile from the intended major. The number of contacts and persistence through the freshman year approached significance at $p<.06$.

Subpopulations of enrolled freshmen students identified by their participation in each of the contacts were found to differ from those not contacted as shown in Tables 4 through 7. In each analysis, less than two variables would be expected to show significance at the $p<.05$ level by chance alone. Means are provided for the contacted and not contacted groups with eta values indicating degree of total linear and curvilinear relationship between participation in the contact and the characteristics variables.

Insert Table 4 here

Those participating in the high school visits, as indicated in Table 4, had lower ACT scores, indicated less need for help in mathematics, planned fewer extracurricular activities, and came from smaller communities that those not participating. However, they achieved higher college grade point averages and held higher expectations of grade point average. This subpopulation might be described as tending toward academic 'overachievement'. Although significant, the eta values for these variables are small, and little variance is accounted for. Persistence through freshman year did not differ significantly from those not participating in high school visit activities.

The subgroup involved in returning the card from response to their mail inquiry seems to differ more distinctly from the non-mail inquiry group as seen in Table 5.

Insert Table 5 here

This group is particularly distinct in the lower average ACT score, the reduced certainty of academic major and vocational choice, and reduced indication of need for assistance in vocational decision making. Students involved in this contact indicate less need as well for help with study skills and less past and future extracurricular involvement. This was the only subgroup that differed significantly in surety of choice of academic major and vocation. Despite particu-

larly low ACT scores and lack of surety, this group indicated less need for assistance in both academic and personal areas. Retention through the freshman year, however, did not differ significantly from that of the remainder of the freshman class.

Table 6 indicates those participating in campus visit contacts were not markedly different than those not visiting the campus.

Insert Table 6 here

Significant differences were found for ACT composite score, request for assistance in reading, past art activities, and extracurricular involvements. This subgroup exhibited lower scores in these areas than those not involved in campus visits.

As would be expected, those involved in the Presidential Scholarship application process differed greatly from those not involved as indicated in Table 7.

Insert Table 7 here

Actual and expected achievement was significantly higher for this group on ACT scores, grade point average, and expected level of education. The group indicated less need for academic assistance and greater involvement in leadership, su-

sic, and speech activities. Those in this subgroup had come from smaller communities and had been involved in fewer work activities. Contrary to expectation, however, persistence of this group only approached significance at $p<.07$ when compared to those not involved in the scholarship application contact.

DISCUSSION

The self-selection inherent in the process of pre-enrollment contact with the university was hoped to provide for identification of subgroups exhibiting differential application, enrollment, and persistence behaviors. The variables found to distinguish these subgroups from the general freshman class might then be helpful in explaining and/or predicting application, enrollment, and persistence. The findings of the study did not support the hypothesis of differential freshman year persistence behaviors for those contacted and those not contacted. Examination of persistence at various stages through graduation may yet confirm differing retention behaviors for contact groups. Groups defined by pre-enrollment contacts of high school visit, return of mail inquiry card, and Presidential Scholarship application however, were found to be distinct from the general freshman class on a variety of characteristics. Many specific characteristics found to distinguish these subpopulations are perhaps of less interest than the broader description of the groups obtained from the cluster of significant characteris-

tics due to the size of the samples, relative ease of exhibiting significance, and the small proportion of variance accounted for. In addition to the identificaton of disguishing characteristics, the study indicated that application and enrollment behaviors increased with the number of contacts. Future efforts to explain or predict these behaviors might consider the subgroups as distinct populations and determine for each the relative impact of those variables found here to distinguish each subgroup from the general freshman class.

EXHIBIT

ACHIEVER
Difference between a standardized achievement variable (high school rank) and a standardized ability variable (ACTCOMP); range approximately -3 to +3.

ACTCOMP
ACT Composite score of English, Mathematics, Social Studies, and Natural Science subtest scores, standard score from 1 to 36

ARTT
Art oriented, out of class accomplishments while in high school; range is from 0 to 7; total of items 136-142 of ACT Student Profile

ATHT
Athletic oriented, out of class accomplishments while in high school; ranges from 0 to 7; total of items 157-163 on ACT Student Profile

AXIS1
Scale value on one of two dimensions of grid plotting the location of selected major fields of study

AXIS2
Scale value on the second of two dimensions of grid plotting location of selected major fields of study

CGPA
Cumulative college grade point average at the end of spring semester; range from 0.00 to 4.00

COMSIZE
Size of home community; ranges from 1 (farm or open country) to 9 (populations of more than one million); item 60 on ACT Student Profile

DEVAXIS1
Difference between student interests from ACT interest inventory and selected majors on one axis of two dimensional coordinate system

DEVAXIS2
Difference between student interests from ACT interest inventory and selected majors on the second axis of a two dimensional coordinate system

DEVMAJ
Distance between student interests on the ACT interest inventory and the major selected, both plotted on a two dimensional coordinate system

DGPA
Difference between actual first semester grade point average and cumulative high school grade point average from registrar's records; range from 0.00 to 4.00

EXPGPA
Student's expected cumulative GPA at the end of the first year in college; ranges from 1 (GPA of 0.5-0.9) to 7 (GPA of 3.5-4.0); item 17, ACT Student Profile

EXPLEVEL
Student's expected level of educational attainment; ranges from 1 (vocational/technical program) to 5 (professional level degree); 6 (other) was considered an omit; item 16 on ACT Student Profile

HELPMATH
Student's belief that help is needed with mathematical skills; item 23 Act Student Profile

HELPPERS
Student's belief that personal counseling is needed; dicotomous score; item 24, ACT Student Profile

HELPREAD
Student's belief that help is needed with reading; dicotomous score; item 21, ACT Student Profile

HELPSTUD
Student's belief help is needed with study skills; dicotomous score; item 22, ACT Student Profile

HELPVOC
Student's belief that help is needed with educational and vocational plans; dicotomous score; item 19, ACT Student Profile

HELPWRIT
Student's belief help is needed with writing skills; dicotomous score; item 20, ACT Student Profile

LEADERT
Leadership oriented, out of class accomplishments while in high school; range from 0 to 7 of the specific categories accomplished; total of items 115-121 ACT Student Profile

MUSICT

Music oriented, out of class accomplishments while in high school; range from 0 to 7; total of items 122-128 ACT Student Profile

OPCLACC
Total out of class accomplishments during the high school years; range is from 0 to 63; total of items 115-177 on ACT Student Profile

PLANICUR
Planned participation in extracurricular activities for college years; range from 0 to 16; total of items 40-55 on ACT Student Profile

PREVICUR
Participation in extracurricular activities while in high school; range from 0 to 16; total of items 99-114 on ACT Student Profile

SCIENCET
Science oriented, out of class accomplishments while in high school; range from 0 to 7; total of items 150-156, ACT Student Profile

SERVICET
Community service, out of class accomplishments while in high school; range from 0 to 7; total of items 164-170 on ACT Student Profile

SPEECHT
Speech oriented, out of class accomplishments while in high school; range from 0 to 7; total of items 129-135 ACT Student Profile

SUREMAJ
Student confidence in choice of major; range 1 (very sure) to 3 (not sure); item 14, ACT Student Profile

SUREVOC1
Student confidence in future occupational choice; range from 1(very sure) to 3 (not sure); item 15, ACT Student Profile

WORKT
Work experience accomplishments while in high school; range from 0 to 7; total of items 171-177 on ACT Student Profile

WRITINGT
Writing oriented, out of class accomplishments while in high school; range from 0 to 7; total of items 143-149 ACT Student Profile

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TABLE 1

Application, Enrollment, and Persistence
by Number of Contacts

Number of Contacts	Row Total	Applied	Enrolled	Contacts Persisted	Enrollees Persisted
1	10,889	2980 27.4%	1717 15.7%	1561 14.3%	90.9%
2	1,990	1332 66.9%	822 41.3%	760 38.2%	92.7%
3	170	150 88.2%	91 53.5%	87 51.2%	95.6%
4	15	14 93.3%	12 80.0%	12 80.0%	100.0%
5	2	2 100.0%	2 100.0%	1 50.0%	50.5%
Total	13,066	4478 34.3%	2644 20.2%	2421 18.5%	91.6%

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Table 2

Application, Enrollment, and Persistence
by Type of Contact

	Row Total	Applied	Enrolled	Contacts Persisted	Enrollees Persisted
High School Visit	2,115	1,006 47.6%	632 29.9%	585 27.7%	92.6%
Return Mail Inquiry Card	765	495 64.7%	245 32.0%	226 29.5%	92.2%
Campus Visit	287	199 69.3%	119 41.5%	111 38.7%	93.3%
Presidential Scholarship Applicant	399	319 79.9%	187 46.9%	178 44.6%	95.2%

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TABLE 3

Number of Contacts and Characteristics
From ACT Profile and Registrar's Record

VARIABLE	DIRECTION OF RELATIONSHIP	SIGNIFICANCE LEVEL	GRAND MEAN
ACTCOMP	+	.0000	21.84
CGPA	+	.0000	2.54
EXPLEVEL	+	.0007	3.82
EXPGPA	+	.0000	5.60
HELPSTUD		.0256	0.30
HELPMATH		.001	4.58
COMSIZE	-	.0000	2.16
MUSICT	+	.0000	4.14
PLANXCUR	+	.0150	4.08
PREVXCUR	+	.0001	50.42
AXIS1		.0105	10.92
DEVMAJ		.1334	-0.69
DGPA	-	.0077	

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33 variables entered. Less than 2 variables expected to be significant at the $p<.05$ level by chance alone

TABLE 4

Characteristics of Participants in
High School Visit Contacts who Enroll*

	ETA	MEAN OF CONTACTED	MEAN OF NOT CONTACTED	GRAND MEAN
ACTCOMP	.04	21.36	22.0	21.84
CGPA	.04	2.61	2.52	2.54
EXPGPA	.04	5.68	5.58	5.60
HELPMATH	.05	.26	.31	.30
COMSIZE	.06	4.41	4.63	4.58
PLANXCUR	.04	3.93	4.20	4.14
DEVAXIS2	.05	2.85	1.83	2.06

*Characteristics of the group of 632 participants significant at $p<.05$ level. Less than 2 of the 32 variables examined would be expected to show significance by chance alone.

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TABLE 5

Characteristics of Participants in
Mail Inquiry Return Contact who Enroll*

	ETA	MEAN OF CONTACTED	MEAN OF NOT CONTACTED	GRAND MEAN
ACTCOMP	.25	16.35	22.41	21.84
SUREMAT	.04	1.83	1.95	1.94
SUREVOC	.05	1.96	2.09	2.08
HELPVOC	.13	.27	.50	.48
HELPWRIT	.05	.12	.19	.19
HELPREAD	.06	.16	.24	.23
HELPSTUD	.11	.15	.32	.30
HELPMATH	.09	.17	.31	.30
HELPPERS	.05	.19	.26	.26
PLANXCUR	.13	3.04	4.25	4.14
PREVXCUR	.16	2.81	4.21	4.08

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*Characteristics of the group of 245 participants significant at $p < .05$ level. Less than 2 variables would be expected to show significance by chance alone.

TABLE 6

Characteristics of Participants in
Campus Visit Contact who Enroll*

	ETA	MEAN OF CONTACTED	MEAN OF NOT CONTACTED	GRAND MEAN
ACTCOMP	.08	19.35	21.96	21.84
HELPREAD	.04	.15	.24	.23
ARTT	.06	.50	.88	.87
PREVXCUR	.04	3.56	4.10	4.08

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*Characteristics of the group of 119 participants significant at $p<.05$ level. Less than 2 variables would be expected to show significance by chance alone.

TABLE 7

Characteristics of Presidential Scholarship Applicants who Enroll*

	ETA	MEAN OF CONTACTED	MEAN OF NOT CONTACTED	GRAND MEAN
ACTCOMP	.21	27.16	21.44	21.84
CGPA	.23	3.28	2.48	2.54
EXPLEVEL	.12	4.19	3.79	3.82
EXPGPA	.25	6.43	5.54	5.60
HELPWRIT	.06	.10	.19	.19
HELPREAD	.06	.14	.24	.23
HELPSTUD	.10	.13	.32	.30
HELPMATH	.11	.11	.31	.30
COMSIZE	.14	3.73	4.65	4.58
LEADERT	.06	1.96	1.57	1.60
MUSICT	.11	2.98	2.10	2.16
SPEECHT	.12	1.68	1.0	1.05
WORKT	.07	1.82	2.19	2.16
PREVXCUR	.08	4.84	4.02	4.08
OFCLACC	.06	15.49	13.75	13.88
AXIS1	.13	52.69	50.25	50.42
AXIS2	.08	46.04	47.33	47.24
DEVMAJ	.04	11.69	10.85	10.92

*Characteristics of the group of 187 applicants significant at $p < .05$ level. Less than 2 variables would be expected to show significance by chance alone.

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